FIG. 1

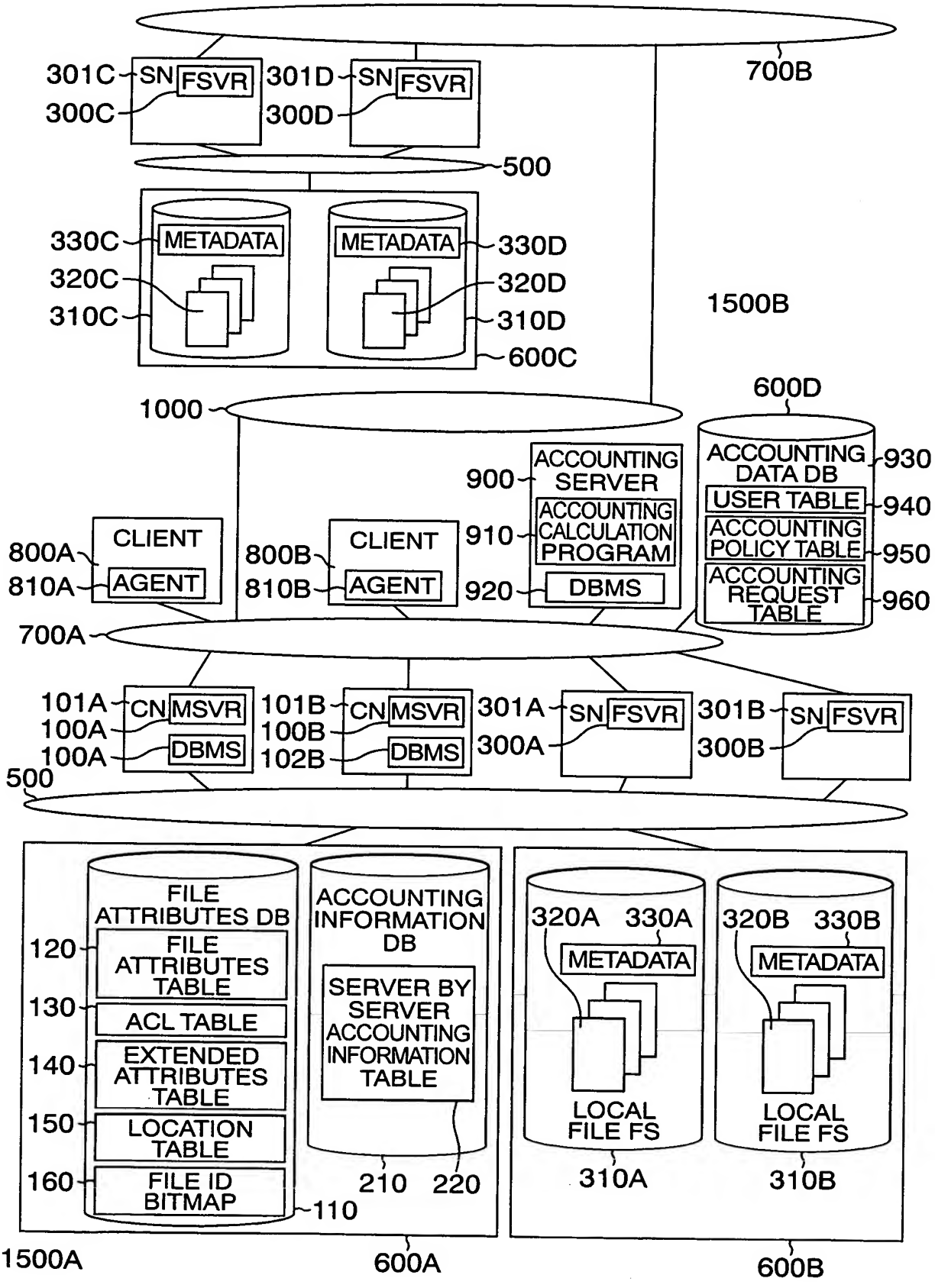
301C
SN
FSVR
300C
301D
SN
FSVR
300D
700B
500
330C
METADATA
320C
310C
METADATA
330D
320D
310D
600C
1500B
1000
600D
ACCOUNTING DATA DB
930
USER TABLE
940
ACCOUNTING POLICY TABLE
950
ACCOUNTING REQUEST TABLE
960
900
ACCOUNTING SERVER
910
ACCOUNTING CALCULATION PROGRAM
920
DBMS
800A
CLIENT
810A
AGENT
800B
CLIENT
810B
AGENT
700A
101A
CN
MSVR
100A
DBMS
100A
101B
CN
MSVR
100B
DBMS
102B
301A
SN
FSVR
300A
301B
SN
FSVR
300B
500
FILE ATTRIBUTES DB
120
FILE ATTRIBUTES TABLE
130
ACL TABLE
140
EXTENDED ATTRIBUTES TABLE
150
LOCATION TABLE
160
FILE ID BITMAP
110
ACCOUNTING INFORMATION DB
SERVER BY SERVER ACCOUNTING INFORMATION TABLE
210
220
320A
330A
METADATA
LOCAL FILE FS
310A
320B
330B
METADATA
LOCAL FILE FS
310B
1500A
600A
600B

FIG. 2

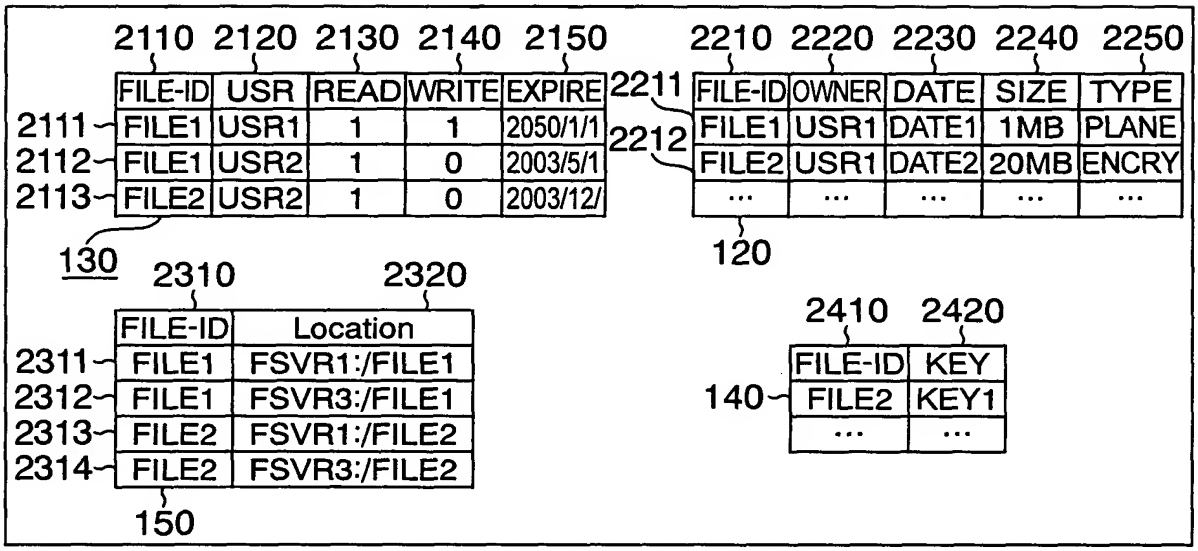

FIG. 3

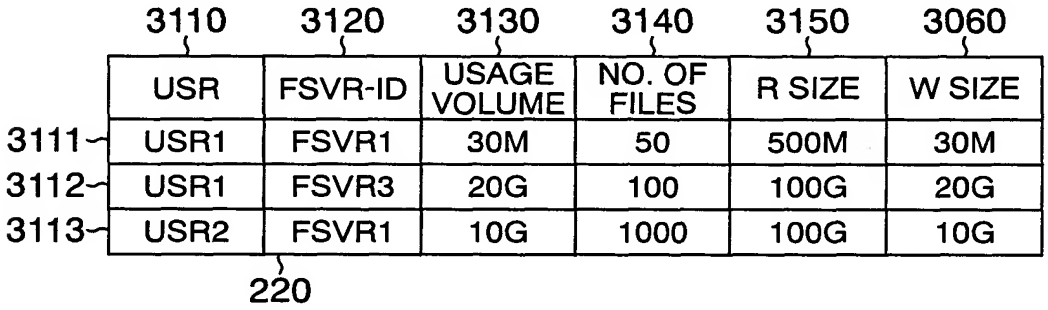

FIG. 4A
WRITE REQUEST

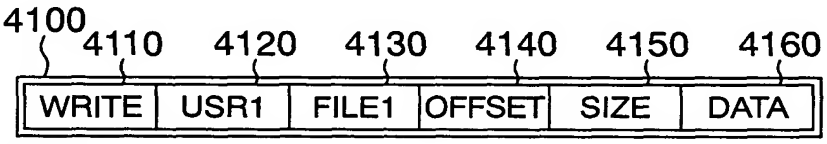

FIG. 4B
READ REQUEST

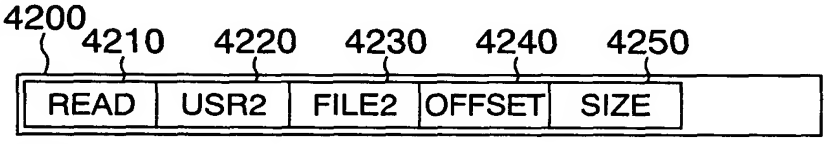

FIG. 4C
CREATE REQUEST

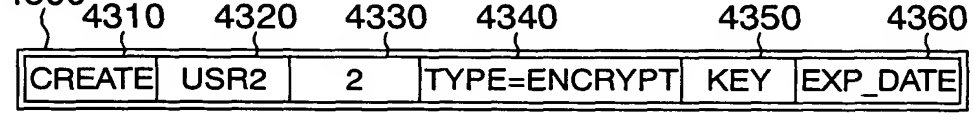

FIG. 5A

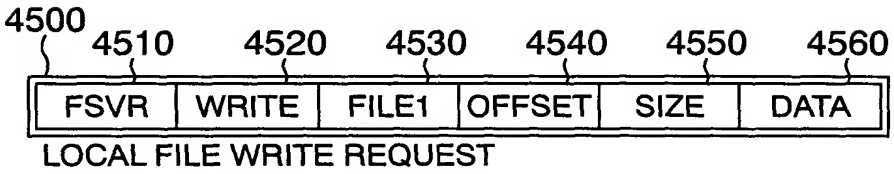

FIG. 5B

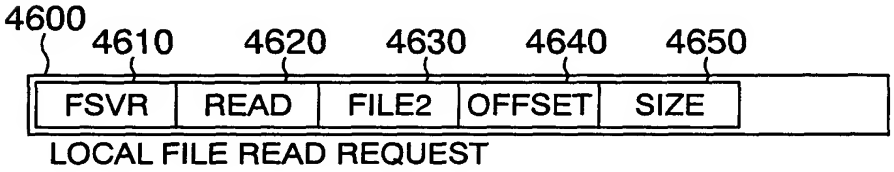

FIG. 5C

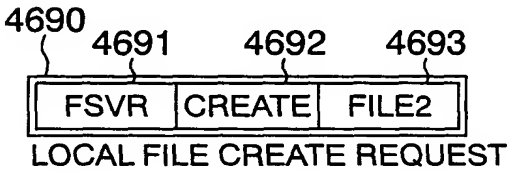

FIG. 6

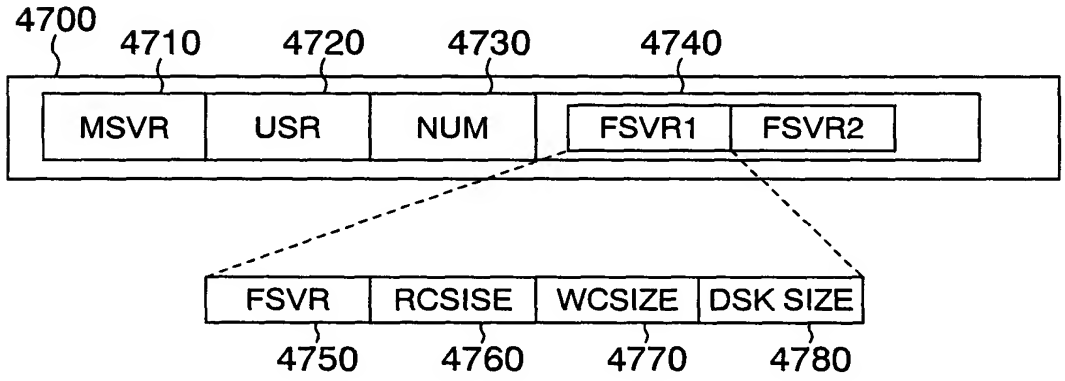

FIG. 7

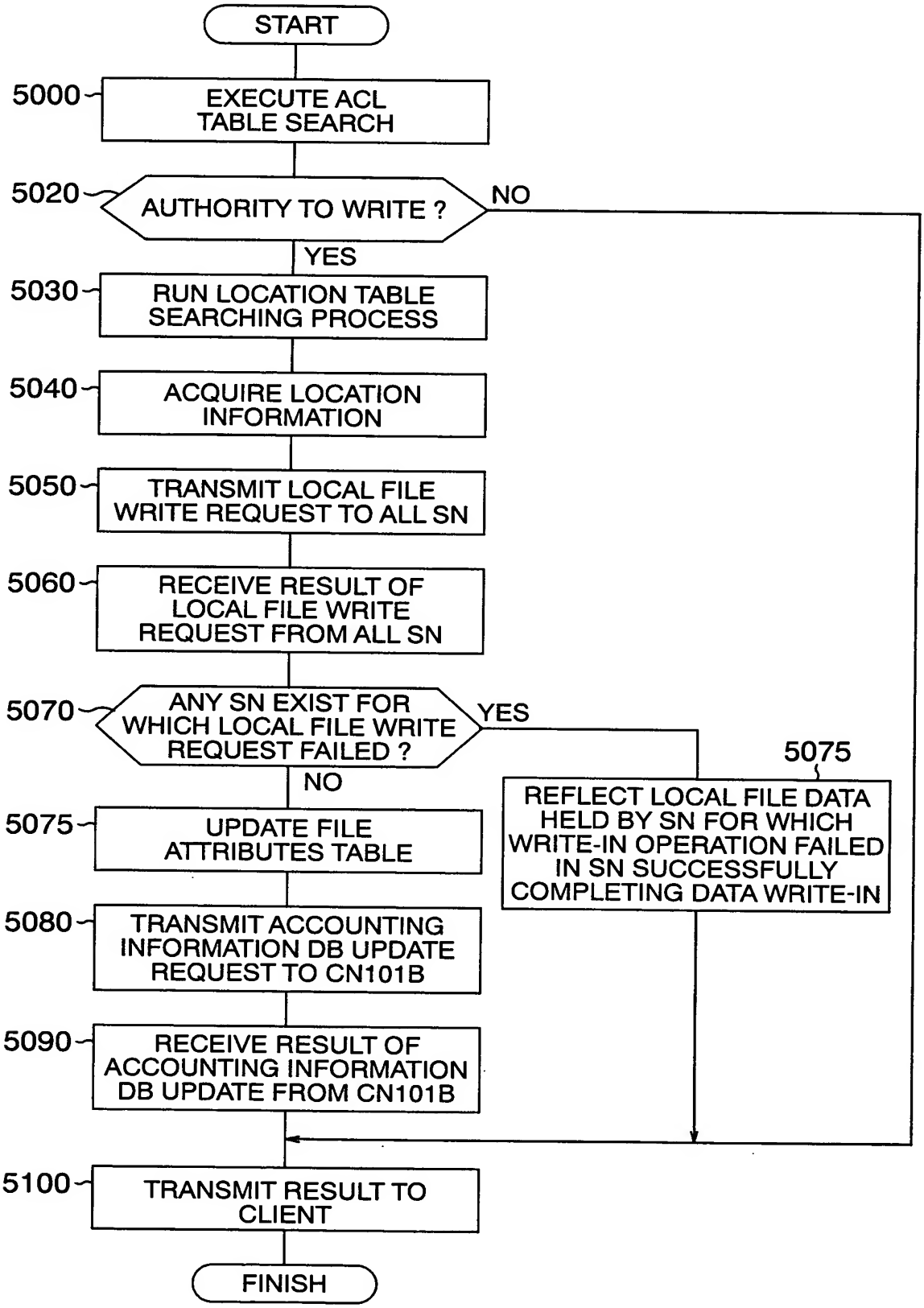
START
5000
EXECUTE ACL TABLE SEARCH
5020
AUTHORITY TO WRITE ?
NO
YES
5030
RUN LOCATION TABLE SEARCHING PROCESS
5040
ACQUIRE LOCATION INFORMATION
5050
TRANSMIT LOCAL FILE WRITE REQUEST TO ALL SN
5060
RECEIVE RESULT OF LOCAL FILE WRITE REQUEST FROM ALL SN
5070
ANY SN EXIST FOR WHICH LOCAL FILE WRITE REQUEST FAILED ?
YES
NO
5075
REFLECT LOCAL FILE DATA HELD BY SN FOR WHICH WRITE-IN OPERATION FAILED IN SN SUCCESSFULLY COMPLETING DATA WRITE-IN
5075
UPDATE FILE ATTRIBUTES TABLE
5080
TRANSMIT ACCOUNTING INFORMATION DB UPDATE REQUEST TO CN101B
5090
RECEIVE RESULT OF ACCOUNTING INFORMATION DB UPDATE FROM CN101B
5100
TRANSMIT RESULT TO CLIENT
FINISH

FIG. 8

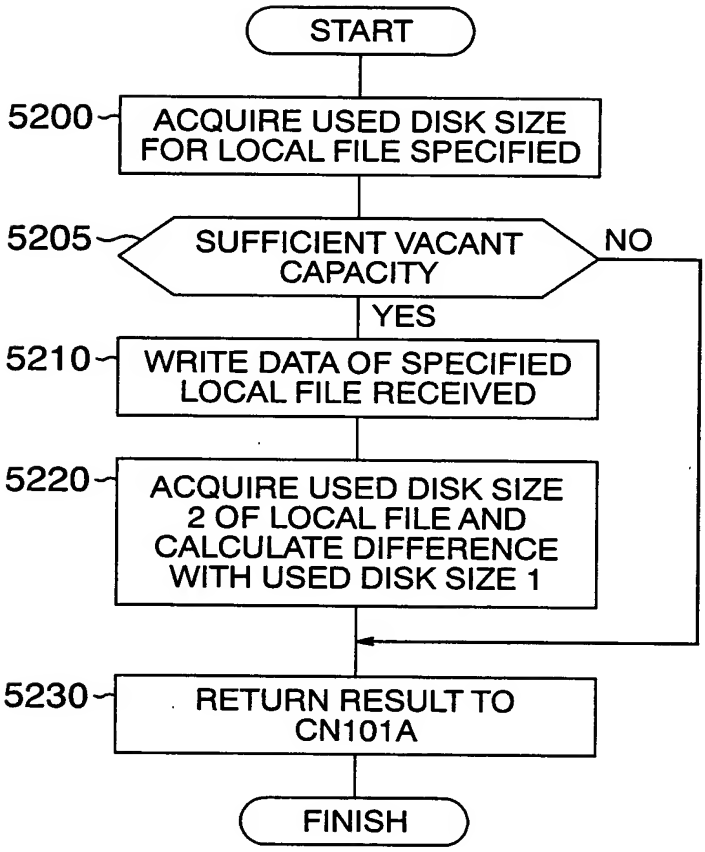
START
5200
ACQUIRE USED DISK SIZE FOR LOCAL FILE SPECIFIED
5205
SUFFICIENT VACANT CAPACITY
NO
YES
5210
WRITE DATA OF SPECIFIED LOCAL FILE RECEIVED
5220
ACQUIRE USED DISK SIZE 2 OF LOCAL FILE AND CALCULATE DIFFERENCE WITH USED DISK SIZE 1
5230
RETURN RESULT TO CN101A
FINISH

FIG. 9

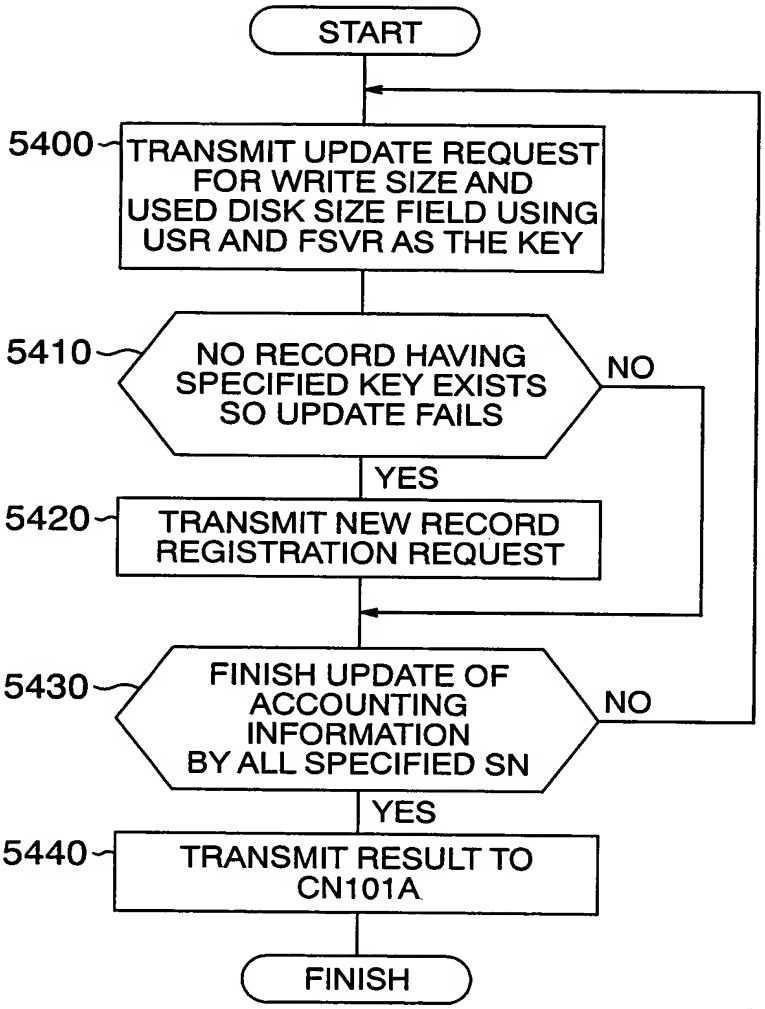
START
5400
TRANSMIT UPDATE REQUEST FOR WRITE SIZE AND USED DISK SIZE FIELD USING USR AND FSVR AS THE KEY
5410
NO RECORD HAVING SPECIFIED KEY EXISTS SO UPDATE FAILS
NO
YES
5420
TRANSMIT NEW RECORD REGISTRATION REQUEST
5430
FINISH UPDATE OF ACCOUNTING INFORMATION BY ALL SPECIFIED SN
NO
YES
5440
TRANSMIT RESULT TO CN101A
FINISH

FIG. 10

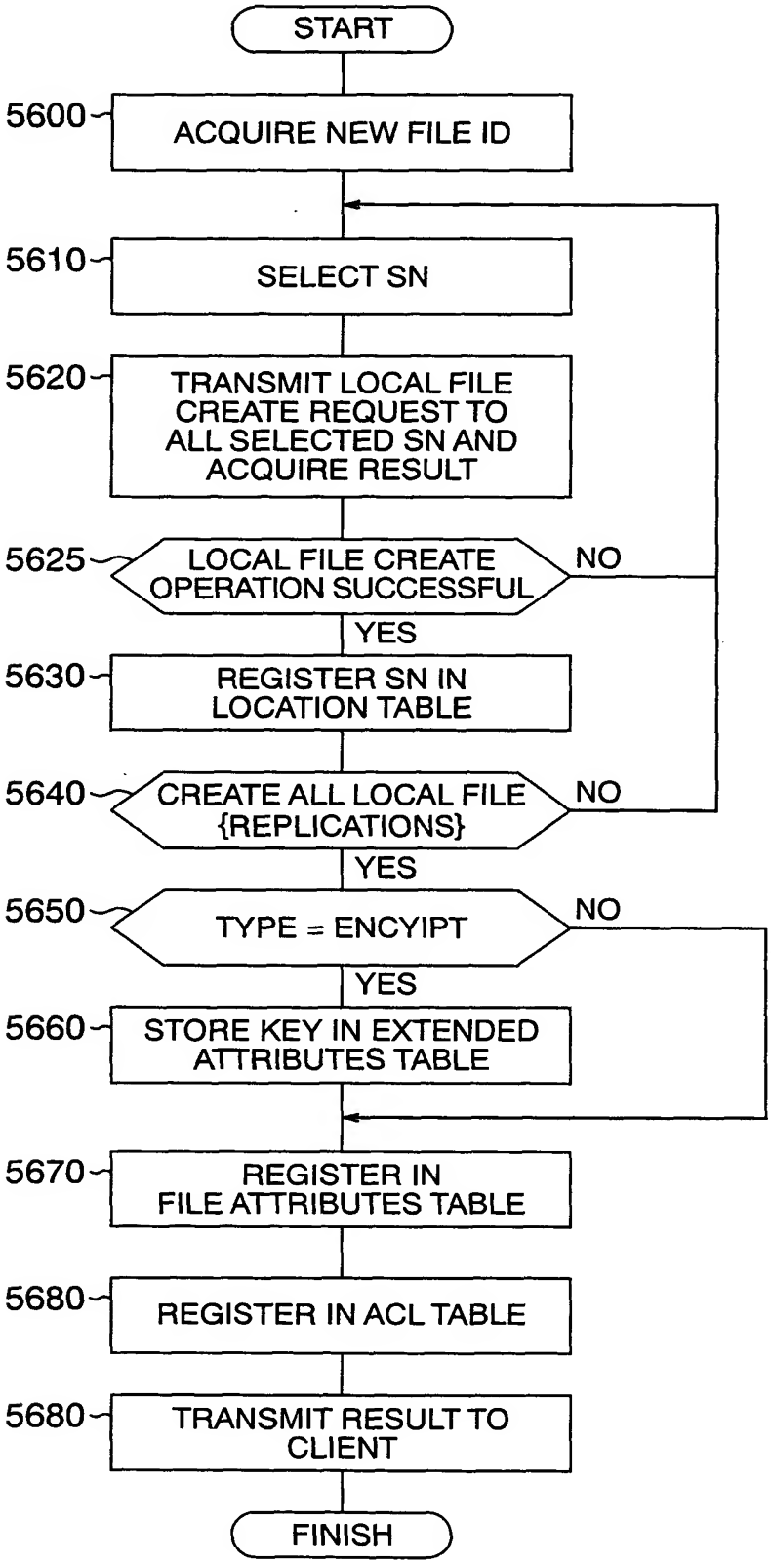
START
5600
ACQUIRE NEW FILE ID
5610
SELECT SN
5620
TRANSMIT LOCAL FILE CREATE REQUEST TO ALL SELECTED SN AND ACQUIRE RESULT
5625
LOCAL FILE CREATE OPERATION SUCCESSFUL
NO
YES
5630
REGISTER SN IN LOCATION TABLE
5640
CREATE ALL LOCAL FILE {REPLICATIONS}
NO
YES
5650
TYPE = ENCYIPT
NO
YES
5660
STORE KEY IN EXTENDED ATTRIBUTES TABLE
5670
REGISTER IN FILE ATTRIBUTES TABLE
5680
REGISTER IN ACL TABLE
5680
TRANSMIT RESULT TO CLIENT
FINISH

FIG. 11

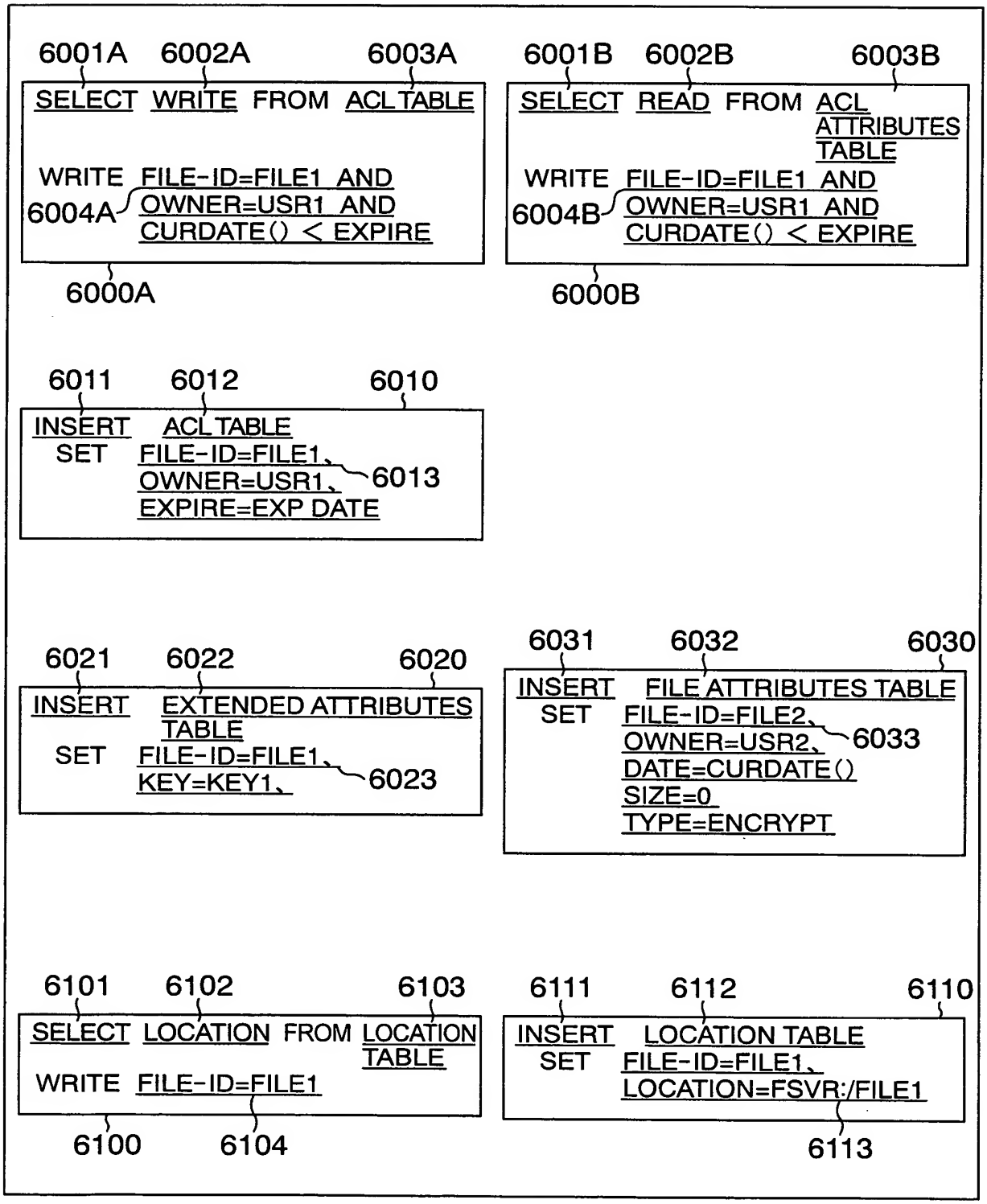
6001A
6002A
6003A
SELECT WRITE FROM ACL TABLE
WRITE FILE-ID=FILE1 AND
6004A OWNER=USR1 AND
CURDATE() < EXPIRE
6000A
6001B
6002B
6003B
SELECT READ FROM ACL ATTRIBUTES TABLE
WRITE FILE-ID=FILE1 AND
6004B OWNER=USR1 AND
CURDATE() < EXPIRE
6000B
6011
6012
6010
INSERT ACL TABLE
SET FILE-ID=FILE1、
OWNER=USR1、
EXPIRE=EXP DATE
6013
6021
6022
6020
INSERT EXTENDED ATTRIBUTES TABLE
SET FILE-ID=FILE1、
KEY=KEY1、
6023
6031
6032
6030
INSERT FILE ATTRIBUTES TABLE
SET FILE-ID=FILE2、
OWNER=USR2、
DATE=CURDATE()
SIZE=0
TYPE=ENCRYPT
6033
6101
6102
6103
SELECT LOCATION FROM LOCATION TABLE
WRITE FILE-ID=FILE1
6100
6104
6111
6112
6110
INSERT LOCATION TABLE
SET FILE-ID=FILE1、
LOCATION=FSVR:/FILE1
6113

FIG. 12

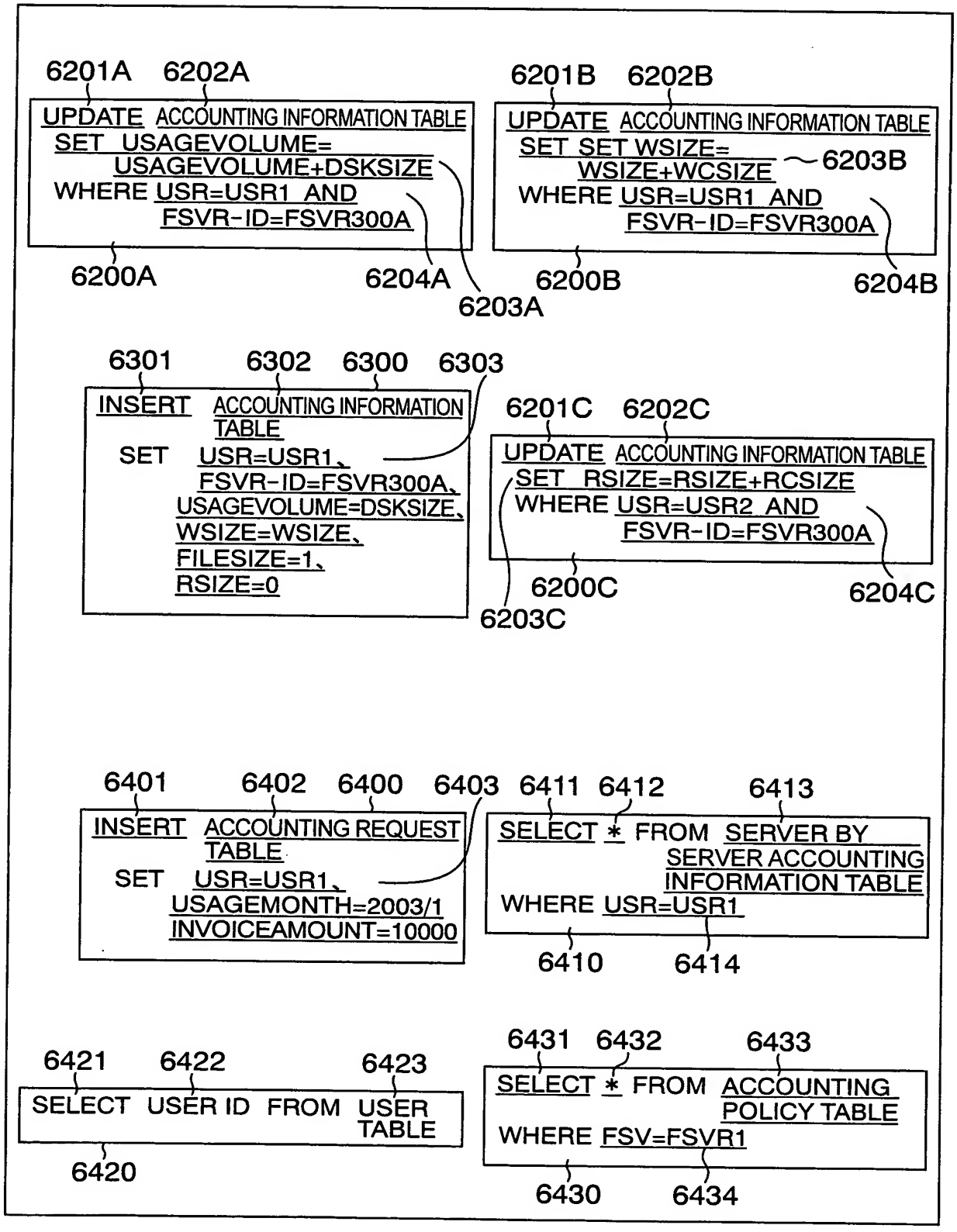
6201A
6202A
UPDATE ACCOUNTING INFORMATION TABLE
SET USAGEVOLUME=
USAGEVOLUME+DSKSIZE
WHERE USR=USR1 AND
FSVR-ID=FSVR300A
6200A
6204A
6203A
6201B
6202B
UPDATE ACCOUNTING INFORMATION TABLE
SET SET WSIZE=
WSIZE+WCSIZE
6203B
WHERE USR=USR1 AND
FSVR-ID=FSVR300A
6200B
6204B
6301
6302
6300
6303
INSERT ACCOUNTING INFORMATION TABLE
SET USR=USR1、
FSVR-ID=FSVR300A、
USAGEVOLUME=DSKSIZE、
WSIZE=WSIZE、
FILESIZE=1、
RSIZE=0
6201C
6202C
UPDATE ACCOUNTING INFORMATION TABLE
SET RSIZE=RSIZE+RCSIZE
WHERE USR=USR2 AND
FSVR-ID=FSVR300A
6200C
6204C
6203C
6401
6402
6400
6403
INSERT ACCOUNTING REQUEST TABLE
SET USR=USR1、
USAGEMONTH=2003/1
INVOICEAMOUNT=10000
6411
6412
6413
SELECT * FROM SERVER BY
SERVER ACCOUNTING
INFORMATION TABLE
WHERE USR=USR1
6410
6414
6421
6422
6423
SELECT USER ID FROM USER TABLE
6420
6431
6432
6433
SELECT * FROM ACCOUNTING
POLICY TABLE
WHERE FSV=FSVR1
6430
6434

FIG. 13

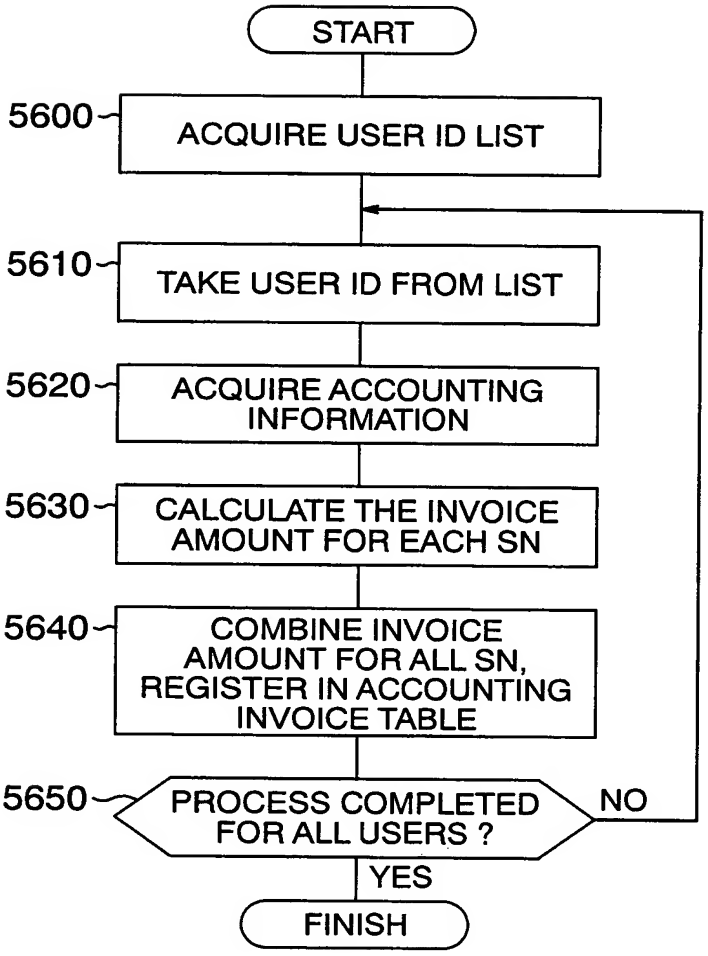
START
5600
ACQUIRE USER ID LIST
5610
TAKE USER ID FROM LIST
5620
ACQUIRE ACCOUNTING INFORMATION
5630
CALCULATE THE INVOICE AMOUNT FOR EACH SN
5640
COMBINE INVOICE AMOUNT FOR ALL SN, REGISTER IN ACCOUNTING INVOICE TABLE
5650
PROCESS COMPLETED FOR ALL USERS ?
NO
YES
FINISH

FIG. 14A

7000	7010	7020	7030
USER ID	NAME	INVOICE RECIPIENT	COMMENT
USR1	NAME1	CHARGE	COMMENT
...	...	...	...

940

FIG. 14B

7100	7110	7120
USER ID	USAGE MONTH	INVOICE AMOUNT
USR1	MONTH	AMOUNT
...	...	...

960

FIG. 14C

7200	7210	7220	7230	7240
FSVR	VOLUME UNIT PRICE	FILE UNIT PRICE	READ UNIT PRICE	WRITE UNIT PRICE
FSVR1	U_VOL	U_F	U_READ	U_WRITE
...	...	...	...	...

950